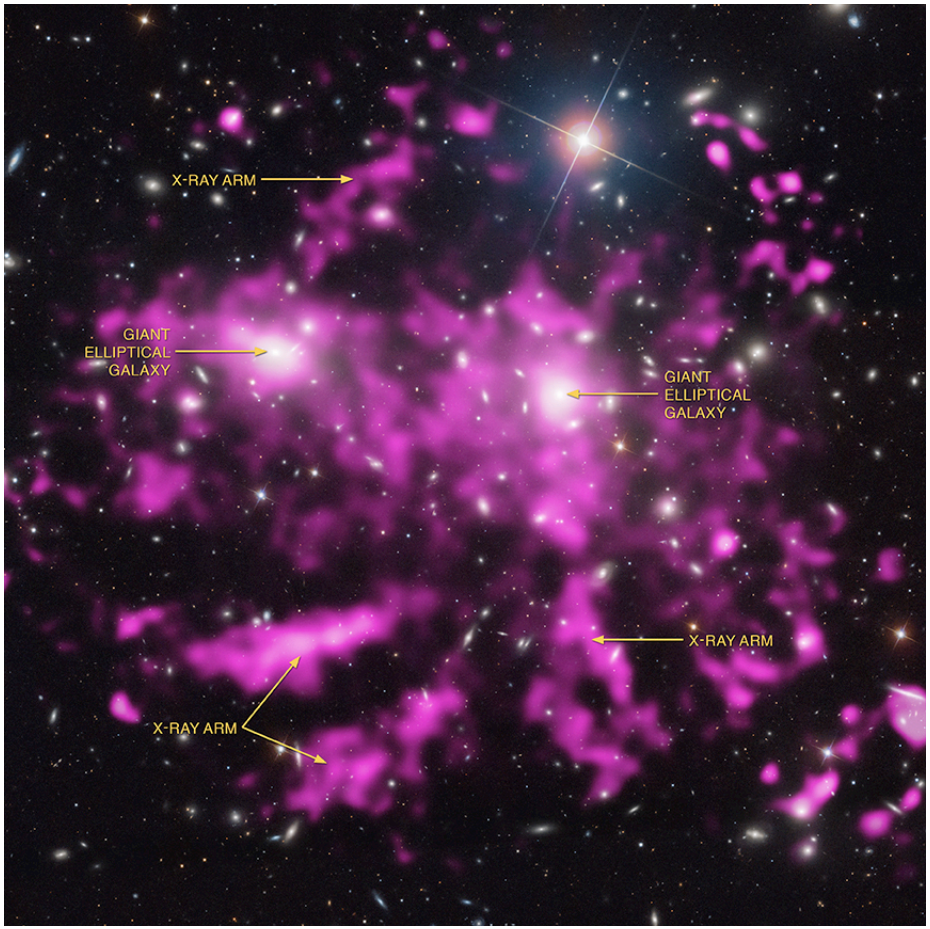
Chandra Science Highlight

Coma Cluster: Clues to the Growth of the Colossus in Coma



Composite image of the central region of the Coma cluster of galaxies, with X-ray data from Chandra in pink and optical data from the Sloan Digital Survey in blue and white. Only the brightest X-ray emission is shown here, to emphasize the newly detected arms of multimillion degree gas, but diffuse hot gas is present over the entire field of view.

- The arms of hot gas, which span at least half a million light years, provide insight into how the Coma cluster has grown through mergers of smaller groups and clusters of galaxies to become one of the largest gravitationally bound structures in the universe.
- The arms were most likely formed when smaller galaxy clusters had their gas stripped away by the headwind created by the motion of the cluster through the hot gas.
- From their length, and the speed of sound in the hot gas (~4 million km/hr), the newly discovered X-ray arms are estimated to be about 300 million years old.
- The relatively smooth shape of the arms suggest that large scale magnetic fields have reduced the amount of the turbulence in the hot gas.

Reference: Sanders, J.S., et al, 2013, Science arXiv:1309.4866

Credit: X-ray: NASA/CXC/MPE/J.Sanders et al, Optical: SDSS

Scale: Scale: Image is 23 arcmin on a side (about 2 million light years)

Distance Estimate: About 318 million light years

Instrument: ACIS

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